

PRELIMINARY

Notice: This is not a final specification.
Some parametric limits are subject to change.

MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGFC36V7785A

7.7~8.5GHz BAND 4W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC36V7785A is an internally impedance-matched GaAs power FET especially designed for use in 7.7~8.5GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

- Class A operation
- Internally matched to 50Ω system
- High output power
 $P_{1dB} = 4W(TYP) @ 7.7\sim 8.5GHz$
- High power gain
 $GLP = 8dB(TYP) @ 7.7\sim 8.5GHz$
- High power added efficiency
 $\eta_{add} = 29\%(TYP) @ 7.7\sim 8.5GHz$
- Hermetically sealed metal-ceramic package
- Low distortion [Item : -51]
 $IM_3 = -45dBc(TYP) @ P_o = 25(dBm) S.C.L.$

APPLICATION

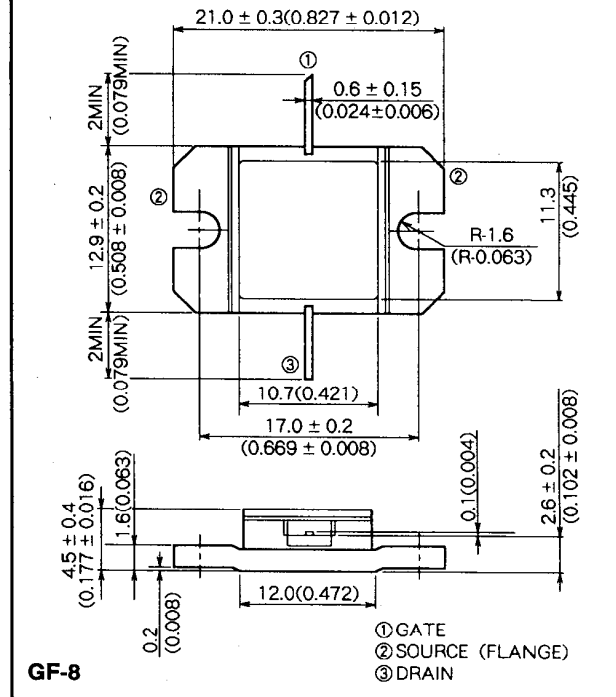
- Item-01 : 7.7~8.5GHz band power amplifier
- Item-51 : Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING

Unit : millimeters (inches)



RECOMMENDED BIAS CONDITIONS

- $V_{bs} = 10V$
- $I_D = 1.2A$
- $R_G = 100(\Omega)$
- Refer to Bias Procedure

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ C$)

Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	- 15	V
V_{GSO}	Gate to source voltage	- 15	V
I_D	Drain current	3.75	A
I_{GR}	Reverse gate current	- 10	mA
I_{GF}	Forward gate current	21	mA
P_T	Total power dissipation * 1	25	W
T_{ch}	Channel temperature	175	$^\circ C$
T_{stg}	Storage temperature	- 65 ~ + 175	$^\circ C$

* 1 : $T_c = 25^\circ C$

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ C$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$	-	-	3.75	A
g_m	Transconductance	$V_{DS} = 3V, I_D = 1.1A$	-	1	-	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3V, I_D = 10mA$	-	-	- 4.5	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10V, I_D = 1.2A, f = 7.7\sim 8.5GHz$	35	36	-	dBm
GLP	Linear power gain		7	8	-	dB
I_D	Drain current		-	-	1.8	A
* η_{add}	Power added efficiency		-	29	-	%
IM_3	3rd order IM distortion * 1		- 42	- 45	-	dBc
$R_{th(ch-c)}$	Thermal resistance * 2	ΔV_f method	-	5	6	$^\circ C/W$

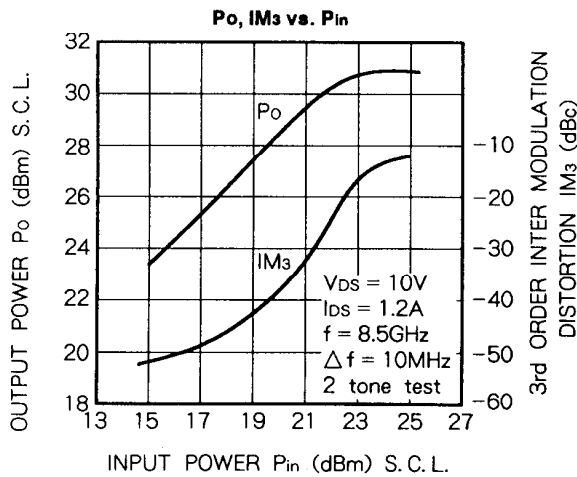
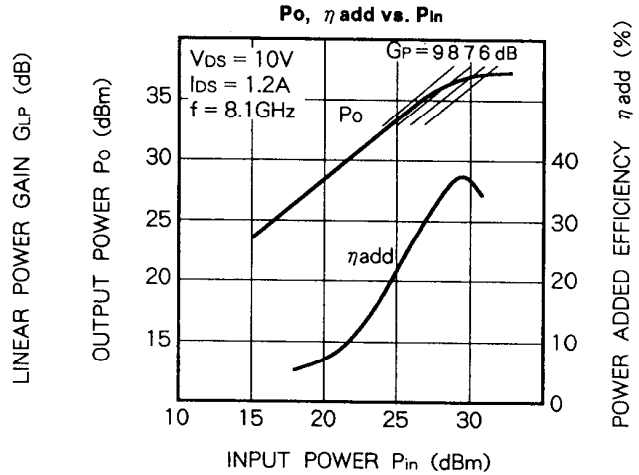
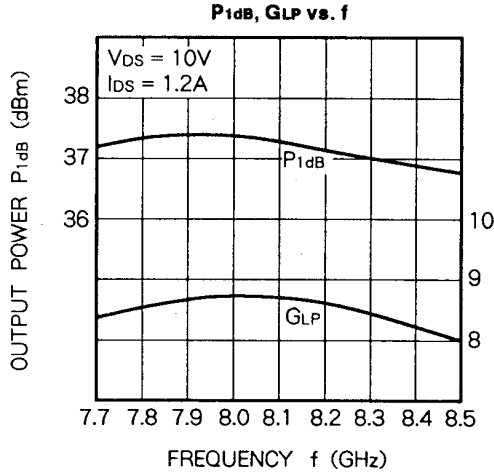
* 1 : Item-51, 2-tone test $P_o = 25dBm$ Single Carrier Level $f = 8.5GHz$ $\Delta f = 10MHz$ * 2 : Channel to case

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TYPICAL CHARACTERISTICS



S PARAMETERS ($T_a = 25^\circ C$, $V_{DS} = 10V$, $I_{DS} = 1.2A$)

f (GHz)	S parameters							
	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)
7.7	0.58	57	2.66	-135	0.069	-179	0.22	124
7.8	0.50	47	2.74	-145	0.072	171	0.20	102
7.9	0.45	39	2.76	-155	0.076	161	0.22	78
8.0	0.40	32	2.73	-165	0.077	152	0.25	63
8.1	0.36	25	2.65	-174	0.074	143	0.32	62
8.2	0.32	14	2.60	178	0.073	135	0.34	70
8.3	0.26	-3	2.56	169	0.071	128	0.32	83
8.4	0.20	-31	2.55	161	0.069	120	0.27	99
8.5	0.18	-80	2.53	151	0.066	111	0.18	122